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(19) (CA) **CANADIAN PATENT** (12)

(54) SCARIFICATION RAKE

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NO. OF CLAIMS 5

Canada

ABSTRACT OF THE DISCLOSURE

A scarification rake consisting of a rear base member and a number of prefabricated teeth secured along the rear base member, each tooth having a front edge inclined rearwardly in a downward direction.

This invention relates to a scarification rake for use on land where logging has taken place to reclaim the land by putting it in a suitable condition for the planting of tree seedlings.

Normally after logging has taken place in a section of forest, a land clearing or root rake is used for the purpose of clearing the scrub cover and debris so that the land can be used for farming or industrial use. The rake is usually mounted on a bulldozer and the debris collected is piled in an area not to be used or is hauled away from the site.

When the land was to be re-forested, it was normally left to regenerate naturally, however this is a very slow process. The seedlings do not require good agricultural conditions for growth but rather need to be planted in a mineral soil organic mixture where the roots can obtain the nutrients and moisture necessary for growing. A single tree seedling requires less than one square foot of mineral soil exposure for its initial growing success. In a coniferous forest cutover there is usually found the common logging debris of branches, tops, dead trees, young shrubs, etc. which can be several feet in depth. This type of site will sometimes take as long as fifteen years to regenerate naturally into a new young coniferous forest and can possibly remain unproductive if it is taken over by weed shrubs. This type of ground cover also cannot be expected to sustain a young seedling which will usually be about six inches in height when planted. There is therefore a requirement to dispose of this debris so that seedlings can be planted soon after harvesting has taken place.

There are many types of forestry scarifying equipment that can be pushed or pulled by rubber tired or tracked prime movers. There are also self-propelled scarifiers. However many of these scarifiers function like conventional root rakes in that they severely expose soil. Also, they gather



the debris which is then collected in huge piles which remain intact for many years. These piles of debris are so large that they cause up to thirty percent of a forest area to be lost from production. Furthermore, the exposed soil which is completely uncovered is susceptible to frost heaving which destroys many planted seedlings. The humus layer in the soil is also removed by conventional root-raking. This type of layer provides nutrients to the soil which are necessary for forest growth.

10 This invention relates to a scarifying rake which overcomes the problems created by all known rakes presently in use and consists of a rake having rearwardly inclined teeth such that when it is mounted on a rubber tired or tracked prime mover it can be pushed or pulled over a cut-over site, and break, push out of the way, or bury debris in front of each tooth set. Adequately spaced parallel lines of soil will therefore be exposed in which seedlings can be planted and the debris will be left in place where seedlings are not planted or will be forced into the ground where the seedlings are planted. The necessary nutrients from decaying debris will therefore be distributed over the site being re-forested.

20 By using the scarification rake of this invention, there will be no piles of debris formed and therefore full use of the site for re-forestation will be achieved.

The scarification rake of this invention will now be described with reference to the accompanying drawings which show a preferred embodiment of the rake. In the drawings:

Figure 1 is a perspective view of the rake of this invention,
 Figure 2 is a front elevational view of the rake shown in Figure 1,
 Figure 3 is a side elevational view of the rake of Figure 1,
 Figure 4 is a partial cross-sectional view on 4-4 of Figure 3; and
 Figure 5 is a partial cross-sectional view on 5-5 of Figure 3.

Referring to the figures, the rake assembly is secured to a prime mover, a part of which is shown in phantom in Figure 1. The rake consists of rear base member 1 having triangular plates 3 extending forwardly at each end. Between plates 3 there is secured a frame 5 consisting of a lower box member, an upper box member 9, cross members 11 and end members 13. Box shaped bracing members 15 extend from the rear of upper box member 9 to the top of rear base member 1.

10 A number of prefabricated teeth 17 are secured along the bottom edge of the rear base member 1. There are three teeth shown in the drawings which in practice will be approximately six feet apart, however more teeth could be used and the spacing between them could be different to suit local conditions.

Each tooth 17 consists of two side plates 19 which have a rearwardly sloping front edge 21 which is preferably formed as shown in Figure 5 with chamfered corners 23 and a short front edge 25. The side plates 19 are secured to a pair of solid or prefabricated body members 27 which straddle an upwardly directed plate 29 having a front edge 31 which as shown in Figure 4 preferably has chamfered corners 33 and a short front edge 35. Strengthening gussets 37 are used at either side of the plate 29.

20 All of the above structure is preferably made of steel and welded together, although, of course, certain parts could be riveted or bolted as required. For instance, it would be convenient to attach the prefabricated teeth 17 to the back plate 1 by bolts so that they could be relatively easily removed for repair or replacement, however due to the conditions under which the rake is working if large sized debris is being moved it may be necessary to weld the teeth to the rear case member 1 to achieve the required strength of the structure.

The rake structure is shown secured to the front of a prime mover as

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would be a bulldozer blade, by, for instance, arms 39 and hydraulic cylinders 41, 43 and 45.

It will thus be seen that when such a rake as shown in the drawings is pushed across ground covered with debris, the debris is broken in front of the teeth 17 and is also pushed downwardly under the ground surface. Rows of cleared ground are therefore obtained, in which tree seedlings can be planted. Only a very minimum amount of debris will be collected in front of the teeth and therefore there will be no requirement to stack debris in large piles or transport it to another region. The debris will therefore eventually decompose and provide nutrients to the soil over all the forest floor.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A scarification rake consisting of a rear base member and a number of prefabricated teeth secured along the rear base member, each tooth having a front edge inclined rearwardly in a downward direction.
2. The rake of claim 1, wherein each tooth includes a pair of downwardly depending plates, each plate having a front edge inclined rearwardly in a downward direction.
3. The rake of claim 2, wherein each tooth includes an upwardly projecting plate which has a front edge inclined forwardly in an upward direction.
4. The rake of claim 2 or 3 wherein the front edge of the downwardly depending plates is chamfered on both sides.
5. The rake of claim 1 including a plate extending forwardly at each end of the rear base member and a frame upstanding between the plates.



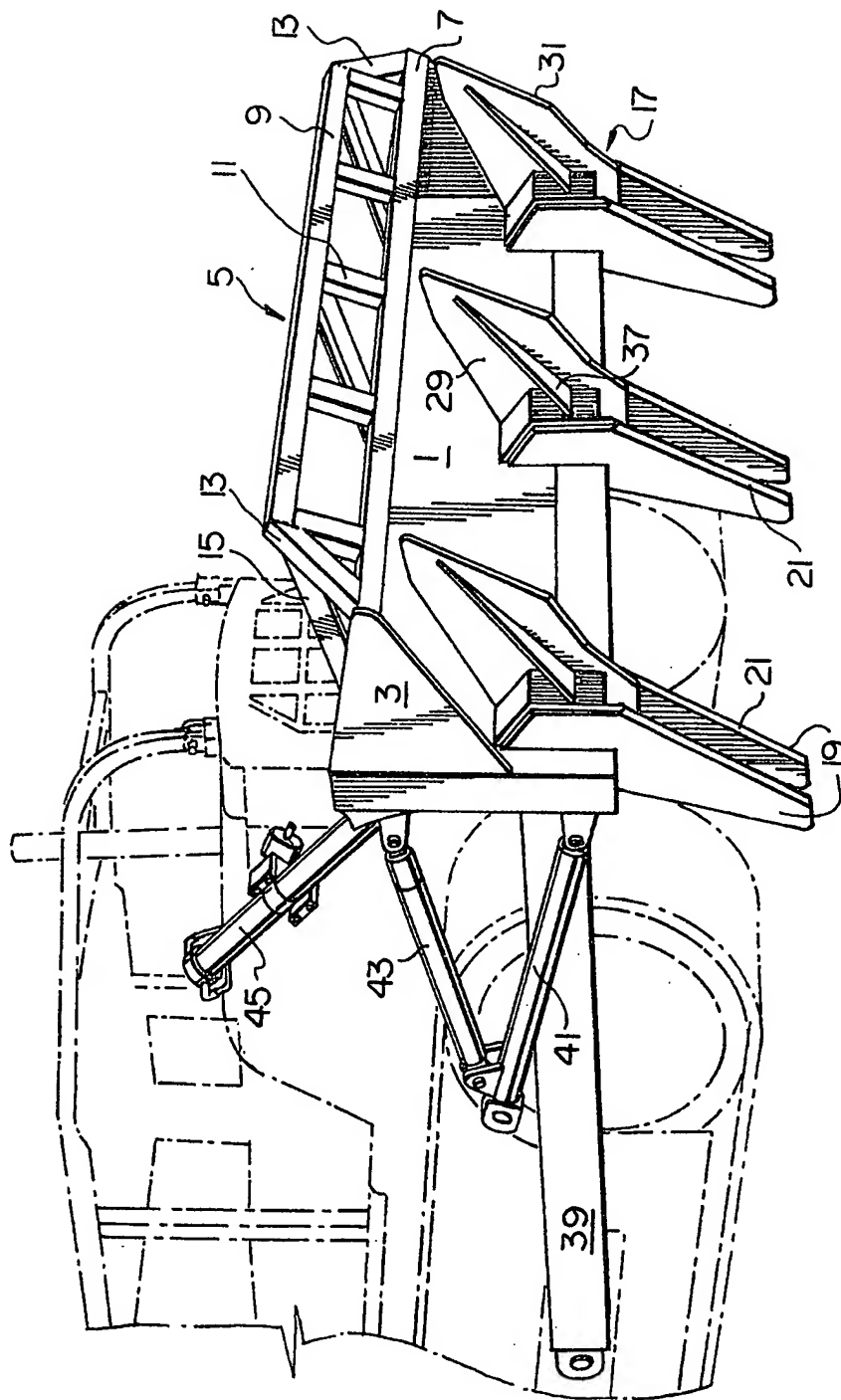


FIG. 1

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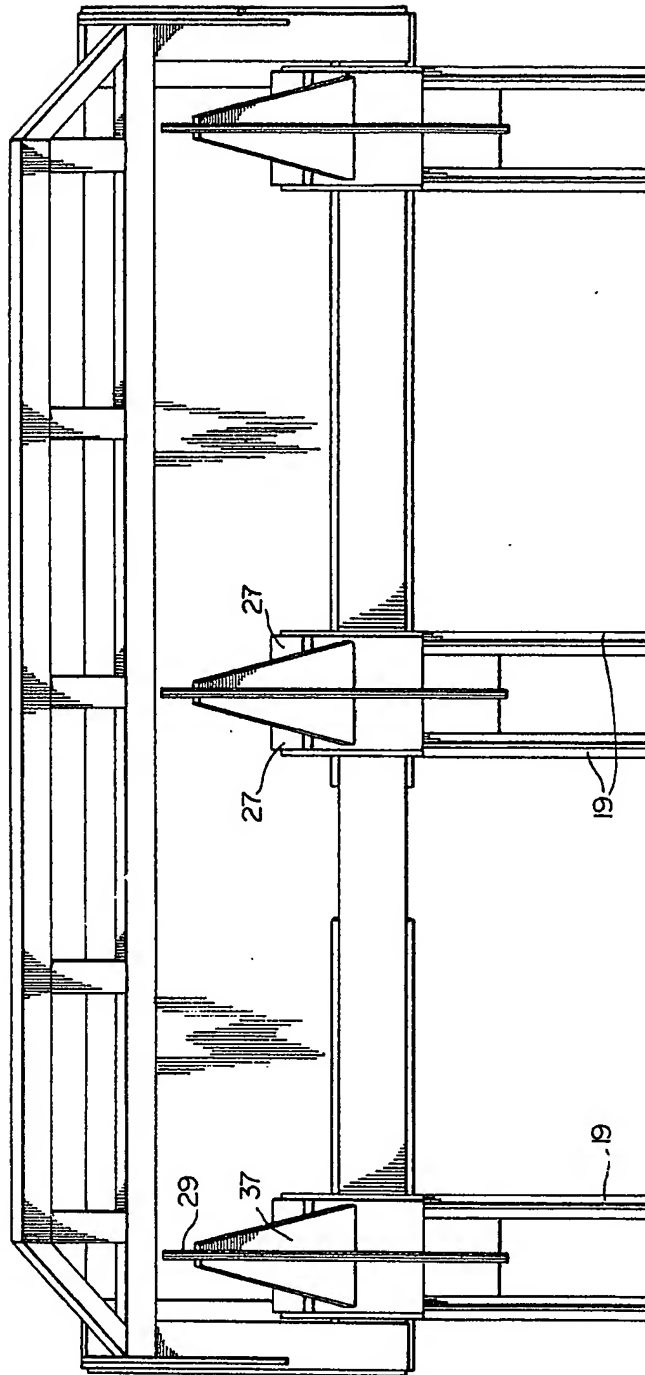


FIG. 2

Scott & Aylton

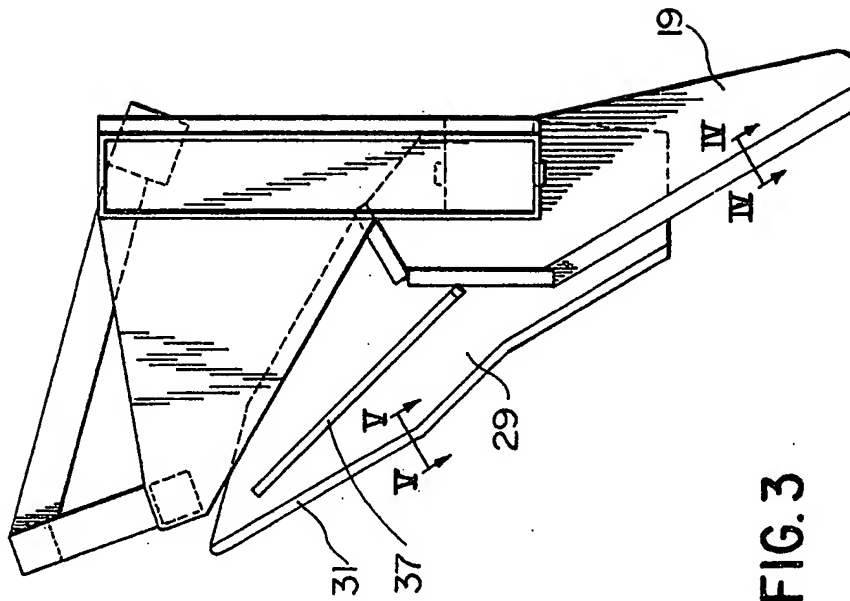


FIG. 3

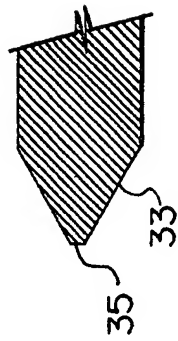


FIG. 4

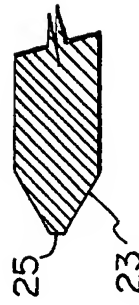


FIG. 5